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Rec'd PCT/PTO 28 JAN 2005

10/523161

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## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference IEC030012PCT		FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/CN03/00378	International filing date (day/month/year) 22.May.2003(22.05.2003)	Priority date (day/month/year) 31.Jul.2002(31.07.2002)	
International Patent Classification (IPC) or national classification and IPC G01N33/569, G01D5/14			
Applicant BEIJING ENTRY-EXIT INSPECTION AND QUARANTINE BUREAU OF THE PEOPLE'S REPUBLIC OF CHINA et al.			
<p>1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 4 sheets, including this cover sheet.</p> <p><input type="checkbox"/> This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and /or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority ( see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of sheets.</p>			
<p>3. This report contains indications relating to the following items:</p> <p>I <input checked="" type="checkbox"/> Basis of the report</p> <p>II <input type="checkbox"/> priority</p> <p>III <input type="checkbox"/> Non-establishment of opinion with regard to novelty ,inventive step and industrial applicability</p> <p>IV <input type="checkbox"/> Lack of unity of invention</p> <p>V <input checked="" type="checkbox"/> Reasoned statement under Article 35(2)with regard to novelty ,inventive step or industrial applicability; citations and explanations supporting such statement</p> <p>VI <input type="checkbox"/> Certain documents cited</p> <p>VII <input type="checkbox"/> Certain defects in the international application</p> <p>VIII <input type="checkbox"/> Certain observations on the international application.</p>			

Date of submission of the demand 23.Oct.2003(23.10.2003)	Date of completion of this report 06.Jan.2005(06.01.2005)
Name and mailing address of the IPEA/CN 6 Xitucheng Rd., Jimen Bridge, Haidian District, 100088 Beijing, China Facsimile No. 86-10-62019451	Authorized officer  Telephone No.86-10-62085767

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.  
PCT/CN03/00378

## I. Basis of the report

## 1. With regard to the elements of the international application:

☒ the international application as originally filed☐ the description:

pages \_\_\_\_\_, as originally filed

pages \_\_\_\_\_, filed with the demand

pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_

☐ the claims:

Nos \_\_\_\_\_, as originally file

Nos \_\_\_\_\_, as amended (together with any statement) under Article 19

Nos \_\_\_\_\_, filed with the demand

Nos \_\_\_\_\_, filed with the letter of \_\_\_\_\_

☐ the drawings:

sheets/fig \_\_\_\_\_, as originally filed

sheets/fig \_\_\_\_\_, filed with the demand

sheets/fig \_\_\_\_\_, filed with the letter of \_\_\_\_\_

☐ the sequence listing part of the description:

pages \_\_\_\_\_, as originally filed

pages \_\_\_\_\_, filed with the demand

pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_

## 2. with regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language \_\_\_\_\_ which is:

☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).☐ the language of publication of the international application (under Rule 48.3(b)).☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

## 3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

☐ contained in the international application in written form.☐ filed together with the international application in computer readable form.☐ furnished subsequently to this Authority in written form.☐ furnished subsequently to this Authority in computer readable form.☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.4. ☐ The amendments have resulted in the cancellation of:☐ the description, pages \_\_\_\_\_☐ the claims No. \_\_\_\_\_☐ the drawings, sheets/fig \_\_\_\_\_5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).\*\*

\* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

\*\* Any replacement sheet containing such amendments must be referred to under item I and annexed to this report.

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement****1. Statement:**

Novelty (N)	Claims	1-9	YES
	Claims		NO
Inventive step (IS)	Claims	2-5, 7, 8	YES
	Claims	1, 6, 9	NO
Industrial applicability (IA)	Claims	1-9	YES
	Claims		NO

**2. Citations and explanations (Rule 70.7)**

Reference is made to the following documents, previously cited in the International Search Report.

D1=WO, A2, 9749989;

D2=CN, A, 1299958;

D3=CN, A, 1261667.

The subject-matter of independent claim 1 refers to a piezoelectric bio-chip for detecting pathogen of mad cow disease.

D1 disclosed a method for detecting complex biologic samples by a sensor array which was comprised of a quartz crystal microbalance array( acting as the piezoelectric array as claimed). The sensor array can be used for detecting BSE( Bovine Spongiform Encephalitis, i.e. pathogen of mad cow disease). The array includes a silicon wafer, a gold film and a biomolecules( including antibody fragments) array. See Page1-5, Page11-18, Fig.1.

Claim 1 restricts that the form of the piezoelectric bio-chip electrode is a microarray, and the different specific antibodies to pathogens of mad cow disease are immobilized respectively at each electrode of the electrode microarray. D2 disclosed a miniature piezoelectric resonant sensor array chip whose structure was the same as the bio-chip described in the claim 1. The chip comprises a base electrode(3)( acting for the shared electrode as claimed) located under piezoelectric resonant diaphragms(2), and miniature electrodes(4) located above the piezoelectric resonant diaphragms. The miniature electrodes form an electrode array and various probes( including antibodies) can be immobilized on the miniature electrodes. The piezoelectric resonant sensor array chip can be used in biologic , pharmacologic or clinical field( seeing Fig.1,Page1-3). D3 disclose these same characters restricted in claim 1, seeing Page10, Fig1,2.

It would be obvious to a skilled person in the art to apply the feature of the electrode

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**Supplemental Box**

(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: V

microarray disclosed in D2 to the sensor array disclosed in D1. So claim 1 lack an inventive step under PCT Article 33(3).

The subject-matter of independent claim 6 refers to a preparation method of a piezoelectric bio-chip for detecting pathogen of mad cow.

D1 disclosed a preparation method of a sensor array of quartz crystal microbalance( acting for the piezoelectric array as claimed), which included locating an array of antibodies and other biomolecules on a gold electrode wafer by chemical bond or other way at room temperature (less than 70°C) during about 1 hr.(within 0.1-24hr as claimed). See Page1-5, Page11-18, Fig.1.

Claim 6 restricts making the piezoelectric bio-chip electrode as a microarray. D2 disclosed a miniature piezoelectric resonant sensor array chip and processing thereof. The processing includes preparing the miniature electrodes array , and the piezoelectric resonant sensor array chip can be used in biologic , pharmacologic or clinical field( seeing Fig.1,Page1-3).

It would be obvious to a skilled person in the art to apply the feature disclosed in D2 to the method disclosed in D1. So claim 6 lack an inventive step under PCT Article 33(3).

Claim 9 is a dependent claim. D1 disclosed the preparation method which included self-assembling the array by a biotin and a avidin at room temperature(25°C). And it is known by a skilled person that the immobilizing time is about 2hr. So the dependent claim 9 lacks an inventive step under PCT Article 33(3) as being obvious over the prior art as applied in the D1, D2 and common knowledge.